

REMARKS

Applicants request reconsideration of the rejections set forth in the Office Action dated July 21, 2009.

Claims 1, 3-20, 22, 24-38, 43-44 and 46 are pending in the application. Claims 1, 19-20, 26, 31-35 and 46 have been amended. Claims 2, 21, 23, 39-42 and 45 have been canceled. No new matter has been added to the application by this amendment.

The Examiner rejected claims 1-46 under 35 U.S.C. § 101, asserting the claimed invention is directed to non-statutory subject matter. Specifically, the Examiner states that “for the instant invention, it is not clear that the process must be carried out via software operating on a computer. As such, the process is not tied to a particular machine and does not meet the *Bilski* test.” Applicant has amended all pending independent claims (1, 26 and 35) to recite that flow simulations are performed on a computer. This is supported in paragraph 80 of the specification, which defines a flow simulation as performed using a computer. Applicant further notes paragraphs 30 and 31 define making economical and/or engineering assessments of the reservoir, and further state such assessments preferably use a computer. Applicant believe the specification and claims as amended fully satisfy the Bilski test and section 101, and therefore the rejection under section 101 should be withdrawn.

The Examiner rejected claims 1-46 under 35 U.S.C. § 112, first and second paragraphs, asserting the claims are not enabled and are incomplete. Specifically, the Examiner states that the specification does not disclose the criteria for deciding whether to carry out the particular steps, and that the claims omit the steps of deciding whether the models should be updated or not and the criteria for making the decision. Applicants have amended independent claim 1 to recite additional limitations to give clarity to the claimed method. For example, claim 1 now recites that updating a three dimensional model is done after comparing assessments (economic and/or engineering) of that model and another generated model, and a determination is made that the model is to be updated. Independent claims 26 and 35 have been amended to include similar recitations. Furthermore, paragraph 83 of the specification gives an example of when a reservoir model may be updated: when new data is available. Of course, one skilled in the art would also be able to determine, after

comparing assessments of two reservoir models, when to update a reservoir model to provide another reservoir model. Because the claims as amended include omitted steps in the method, and because the specification give at least one example of a reason why a reservoir model may be updated, the rejections under 35 U.S.C. § 112 should be withdrawn.

Applicants' claim amendments, it is believed, provide further clarity and definition to what is considered the invention.

Turning to the merits, the Examiner rejected claims 1-46 under 35 U.S.C. § 103(a) as being unpatentable over Vasco in view of the taking of official notice. Applicants have canceled claims 2, 21, 23, 39-42 and 45, thereby rendering moot the rejection thereto. With respect to the remaining claims, applicants respectfully traverse the rejection.

Vasco discloses a method of integrating dynamic data into high-resolution reservoir models using streamline-based analytic sensitivity coefficients. According to the abstract provided by the Examiner, Vasco uses an extremely efficient three-dimensional multiphase streamline simulator as a forward model, and then formulates sensitivities in terms of one-dimensional integrals of analytic functions along the streamlines. Then, a two-step iterative inversion is performed that involves lining up the break through times at the producing wells and matching the production history.

Upon review of applicants' amended claims, it should be clear that the forward modelling, sensitivity coefficients, two-step iterative inversion, and subsequent history matching of Vasco is discussing a process completely different from applicants' claimed invention, which in claim 1 (for example) is a method of evaluating a reservoir that provides a first three dimensional reservoir model, performs a flow simulation on the first reservoir model, makes an assessment using the first reservoir model, and updates the first reservoir model to provide a second reservoir model when it is determined that the first reservoir model is to be updated, where additional reservoir models are created when comparing assessments of previously provided reservoir models. The recursive computations of inversion in Vasco are not analogous to – and fail to teach or suggest – providing multiple three dimensional reservoir models, each including different types of data or information therein, as claimed in applicants' independent claims 1, 26, and 35, and these claims are therefore allowable. All other pending claims depend directly or indirectly from one of these

allowable independent claims and are therefore allowable for at least the same reasons the independent claims are allowable.

Applicants' dependent claims also include many recitations neither found nor suggested by Vasco. For example, Vasco neither teaches nor suggests the following limitations found in applicants' claims:

- building the three dimensional reservoir framework (claim 3);
- the constant reservoir property values include a plurality of rock-type fraction values, constant rock type fraction values, constant porosity values, constant permeability values, or are average values (claims 4, 18, 28-30, 36);
- the variable reservoir property values include a plurality of constant porosity values, constant permeability values, variable rock-type fraction values, variable porosity values, variable permeability values, or are populated using geostatistics (claims 5-9, 22);
- the reservoir property values derived from the seismic data comprise a plurality of rock-type fraction values derived from seismic data (claim 10);
- the rock-type fraction values are net-to-gross values (claims 43-44);
- updating the second three dimensional reservoir model comprises populating some or all of the cells with variable porosity values or variable permeability values (claims 11-12);
- each cell has a preselected scale (claim 13);
- providing the three dimensional reservoir framework comprises providing the three dimensional reservoir framework at a flow simulation scale, defining a top and bottom surface of the reservoir framework, dividing the three dimensional reservoir framework into one or more stratigraphic sequences, and/or dividing each stratigraphic sequence into one or more layers (claims 14-17);
- making an assessment of the reservoir comprises calculating a net present value for the reservoir (claim 27) based on one of the three dimensional reservoir models (claim 19);

- making an assessment comprises calculating for the reservoir at least one of net present value, discounted cash flow rate, maximum cash impairment, return on capital, and any combination thereof (claim 46);
- comparing assessments of the reservoir comprises calculating a net present value based on one model and a subsequent model, and comparing the two net present values (claim 20);
- retrieving data at one or more scales, and deriving one or more reservoir property values from such data (claim 24);
- retrieving at least one of log data, core data, well test data and seismic data at one or more scales, and deriving one or more reservoir property values from such data (claim 25);
- the other reservoir property values comprise one or more variable porosity and permeability values (claim 31) or variable rock-type fraction values (claim 32), which may be derived from seismic data (claim 33) or production data (claim 34);
- providing the three dimensional reservoir framework comprises providing the three dimensional framework at a flow simulation scale (claim 37); and
- updating the first three dimensional reservoir model comprises populating some or all of the cells with one or more variable porosity and permeability values (claim 38).

Applicants have enumerated each dependent claim limitation to emphasize how distant the disclosure of Vasco is from applicants' claimed invention. Vasco neither teaches nor suggests applicants' invention as recited in the pending claims. All pending claims are therefore allowable.

CONCLUSION

Applicant does not acquiesce to the Examiner's positions in the Office Action of July 21, 2009, but has responded herein to the Office Action to advance prosecution. The absence of an explicit response by Applicant to any of the Examiner's positions does not constitute a concession of the Examiner's positions. The fact that Applicant's comments have focused on particular arguments does not constitute a concession that there are not other arguments for

patentability of the claims. All of the dependent claims are patentable for at least the reasons given with respect to the claims on which they depend.

Applicant has made a diligent effort to place the claims in condition for allowance. However, should there remain unresolved issues that may require adverse action, it is respectfully requested that the Examiner telephone the undersigned Attorney so that such issues may be resolved as expeditiously as possible. For these reasons, this application should now be considered to be in condition for allowance and such action is earnestly solicited.

If necessary, the Commissioner is hereby authorized in this, concurrent, and future replies, to charge payment or credit any overpayment to Deposit Account No. 05-1328 for any additional fees required under 37 C.F.R. §§ 1.16 or 1.17; particularly, extension of time fees.

Respectfully submitted,

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